REMARKS

Claims 2 and 15 have previously been canceled, Claims 1, 3, 4 and 20 have been amended, and Claims 1, 3-14 and 16-20 are pending in this application. Reconsideration of this application is respectfully requested. It is respectfully submitted that this response does not require further searching on the part of the Examiner. It is also respectfully submitted that this response places this application in condition for allowance, or in any event, places it is better condition for consideration on appeal. A petition and fee for a three month extension of time is enclosed.

Claims 3 and 4 were objected to because of the typographical error noted by the Examiner. Claim 3 has been amended to correct the error. Withdrawal of the Examiner's rejection is respectfully requested.

Claims 1, 3-13 and 20 were rejected under 35 U.S.C. § 1§ 12, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1, 3, 4 and 20 have been amended to address the issues raised by the Examiner and are now considered clear and definite. In view of these amendments, withdrawal of the Examiner's rejection is respectfully requested.

Claims 1, 3-13 and 20 were rejected under 35 U.S.C. § 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. The amendments to Claims 1, 3, 4 and 20 address the issues raised by the Examiner. In view of these amendments, withdrawal of the Examiner's rejection is respectfully requested.

Claims 1, 3-6, 8, 10, 11, 13, 14, 16, 17, 19 and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over US Patent No. 6,378,104 issued to Okita in view of US Patent No. 6,317,858 issued to Cameron. As was stated in the prior response, the essence of the Examiner's rejection is that the Okita patent substantially discloses the present invention as recited in Claim 1, but fails to "explicitly teach the specific use of a Chien-Forney module using Forney algorithms to calculate error values." The Cameron patent is cited as disclosing "using Forney algorithms to calculate error values (Forney algorithm circuit 15 in Cameron)."

Amended independent Claims 1 and 20 call for a translator circuit for receiving one of the predetermined number of Reed-Solomon and BCH codes that each have predetermined external Galois-field representations and for translating the external Galois-field representation of the received code into an internal quadratic-subfield Galois-field representation of the code." The Examiner has argued that "a Galois field comprising quadratic-subfield of a Galois-field is still a Galois-field, that is, the term Galois-field encompasses and includes any Galois field comprising quadratic-subfields of a Galois-field.

It is respectfully submitted that this assertion is not the issue. The present invention translates codes that have predetermined external Galois-field representation into an internal quadratic-subfield Galois-field representation of the code. The quadratic subfield representation of the code is an ordered pair of subfield elements that represent an element of the whole field.

The Okita patent transforms the Galois field of the input data from $GF_b(2^m)$ into $GF_a(2^m)$. This is another Galois field, not a representation of the Galois field. The input data is not translated into a "quadratic subfield" representation comprising an ordered pair of subfield elements to represent an element of the whole field. In particular, the $GF_a(2^m)$ representation is not an ordered pair of subfield elements that represent an element of the whole field. The Okita patent discloses or suggests nothing with regard to the use of an ordered pair of subfield elements to represent an element of the whole field. Hence, the teachings of the Okita patent do not disclose or suggest the present invention. Also, the terms "quadratic", "subfield" or "quadratic-subfield" are not used in the Okita patent, or any of the other cited patents for that matter.

Therefore, it is respectfully submitted that the Okita patent does not disclose or suggest "a translator circuit for receiving one of the predetermined number of Reed-Solomon and BCH codes that each have-predetermined external Galois-field-representations and for translating the external Galois-field representation of the received code into an internal quadratic-subfield Galois-field representation of the code." The Examiner has argued that "a Galois field comprising quadratic-subfield of a Galois-field is still a Galois-field, that is, the term Galois-field encompasses and includes any Galois field comprising quadratic-subfields of a Galois-field." Furthermore, it is respectfully submitted that the Cameron patent does not disclose or suggest this aspect of the present invention.

The examiner has taken the position that that a quadratic equation is a polynomial; hence ... the Okita patent encompasses and includes Galois Fields comprised of subfield extensions over quadratic polynomials, i.e., quadratic-subfields of a Galois-field. It is respectfully submitted that the Examiner's argument distorts the express teachings of the Okita patent in order to reject the present invention.

The Examiner's argument rejects the presently claimed invention based upon what is _not_ disclosed in the Okita patent, which is clearly erroneous. The Examiner has extended the teachings of the Okita patent beyond its intended scope. There is no disclosure or suggestion contained in the Okita patent regarding translating an external Galois-field representation of a received code into an internal quadratic-subfield Galois-field representation of the code which is an ordered pair of subfield elements that represent an element of the whole field. This is only taught in the present specification. If such a quadratic-subfield representation of the code would have bee required or desired in the Okita system, then it surely would have been explicitly discussed in the Okita patent. In fact, this is not the case, and the Examiner has improperly extended the express teachings of the Okita patent to assert that quadratic-subfield representations of the code were envisioned by Okita. This is clearly not the case and this position is not supported by the teachings of the Okita patent, only the Examiner's unsupported assertions.

Claims 1 and 20 also call for an inverse translator circuit for translating the internal

quadratic-subfield Galois-field representation of the error-corrected code into the external Galois-field representation. In view of the above arguments, it is respectfully submitted that the Okita and Cameron patents, taken singly or together, do not disclose this aspect of the present invention.

The Examiner position is that since the Cameron patent teaches using Forney algorithms to calculate error values, one skilled in the art would combine the teachings of the Okita patent with the teachings in the Cameron patent to arrive at the present invention. It is respectfully submitted that there is no teaching contained in either cited patent that would suggest their combination. It is respectfully submitted that this is a result of the use of hindsight reconstruction on the part of the Examiner. Furthermore, it is respectfully submitted that Okita would have known about the use of Forney algorithms to calculate error values, and if this was desired or required in his system, it would have been disclosed in the Okita patent. Consequently, the Okita patent provides no motivation for using Forney algorithms to calculate error values in his system.

In view of the above, it is respectfully submitted that Claims 1 and 20 are not obvious in view of the Okita or Cameron patents, taken singly or together. Withdrawal of the Examiner's rejection and allowance of Claims 1 and 20 are respectfully requested.

With regard to Claim 14, and in view of the arguments made with respect to Claims 1 and 20, it is respectfully submitted that the Okita or Cameron patents, taken singly or together, do not disclose or suggest "translating one of a predetermined number of Reed-Solomon and BCH codes that each have predetermined external Galois-field representations into an internal quadratic subfield Galois-field representation" or "translating the internal quadratic subfield Galois-field representation of the error-corrected code into the external Galois-field representation". Neither of the cited patents disclose or suggest a method for decoding Reed-Solomon and BCH codes using quadratic subfield Galois-field representations of the codes. The terms "quadratic", "subfield" or "quadratic-subfield" are not used in the Okita or Cameron patents or any of the other cited patents for that matter.

Therefore, it is respectfully submitted that Claim 14 is not obvious in view of the Okita or Cameron patents, taken singly or together. Withdrawal of the Examiner's rejection and allowance of Claim 14 are respectfully requested.

Dependent Claims 3-6, 8, 10, 11, 13, 16, 17 and 19 are considered patentable based upon the allowability of Claims 1 and 14 from which they depend.

With regard to Claim 4, for example, the Examiner asserted that "Berlekamp-Massey module as taught in Okita is inherently a module for performing Galois-Field computations over matrices and vectors defined over the Galois fields." This argument does not take into account that the presently claimed Berlekamp-Massey module comprises "quadratic-subfield" multipliers, which are not disclosed or suggest in any of the cited references. The issue of quadratic-subfields and their difference from standard Galois-fields employed in the prior art patents is germane to Claim 4.

It is respectfully submitted that there is no teaching or suggestion contained in any of the cited patents that provide for a Berlekamp-Massey module comprising quadratic-subfield multipliers. There is no need for "quadratic-subfield" multipliers in any of the systems taught in the prior art patents because none of them translate an external Galois-field representation of a code into an internal quadratic subfield Galois-field representation of the code. The Examiner's unsupported assertion is mere conjecture as to what one or ordinary skill in the art would do. Absent some specific teaching or suggestion, it is respectfully submitted that the Examiner's position is unsupportable, or at best supportable only using hindsight reconstruction in light of Applicants' teachings.

With regard to Claim 5, for example, none of the prior art references disclose or suggest use of a "Berlekamp-Massey computation module and a Chien-Forney module" that each include "a quadratic-subfield-power integrated divider that carries out Galois-field division in a quadratic-subfield representation." Again, this is because none of the cited patents disclose the translations and inverse translation aspects of the present invention recited in Claim 1.

It is respectfully submitted that the arguments presented in the prior response with regard to the other pending dependent Claims are germane to their allowability.

In view of the above and the previously presented arguments, withdrawal of the Examiner's rejection and allowance of Claims 3-6, 8, 10, 11, 13, 16, 17 and 19 are respectfully requested.

Claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over US Patent No. 6,378,104 issued to Okita and US Patent No. 6,317,858 issued to Cameron in view of US Patent No. 5,323,402 issued to Vaccaro et al. The Examiner repeated the previous rejection.

It is again respectfully submitted that there is no specific teaching contained in the Okita, Cameron or Vaccaro et al. patents which would provide for combining them, absent hindsight reconstruction on the part of the Examiner. The arguments made in the prior response are pertinent. It is also respectfully submitted that Claim 7 is patentable based upon the allowability of Claim 1 from which it depends. Accordingly, it is respectfully submitted that Claim 7 is not obvious in view of the Okita, Cameron or Vaccaro et al. patents, taken singly or together. Withdrawal of the Examiner's rejection and allowance of Claim 7 are respectfully requested.

Claim 9 was rejected under 35 U.S.C. § 103(a) as being unpatentable over US Patent No. 6,378,104 issued to Okita and US Patent No. 6,317,858 issued to Cameron in view of US Patent No. 5,754,563 issued to White. The Examiner repeated the previous rejection.

It is again respectfully submitted that the Okita and Cameron devices would not be modified in light of the teachings of the White patent without using hindsight reconstruction. There is disclosure or suggestion contained in the Okita or Cameron patents regarding the desire to process data in parallel, and therefore adding this feature was not contemplated by them. Modifying the teachings of the Okita or Cameron patents to provide for parallel operation therefore extends their express teachings beyond the scope of the patents, using hindsight reconstruction, using the teachings of the cited patents in light of Applicants' own

teachings.

It is also respectfully submitted that Claim 9 is patentable based upon the allowability of Claim 1 from which it depends. Accordingly, it is respectfully submitted that Claim 9 is not obvious in view of the Okita, Cameron or White patents, taken singly or together. Withdrawal of the Examiner's rejection and allowance of Claim 9 are respectfully requested.

Claims 12 and 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over US Patent No. 6,378,104 issued to Okita and US Patent No. 6,317,858 issued to Cameron in view of US Patent No. 5,323,402 issued to Vaccaro et al. The Examiner repeated the previous rejection. The arguments made in the prior response are pertinent to the allowability of Claims 12 and 18.

Dependent Claims 12 and 18 are also considered patentable based upon the allowability of Claims 1 and 14 from which they depend. Accordingly, it is respectfully submitted that Claims 12 and 18 are not obvious in view of the Okita, Cameron or Vaccaro et al. patents, taken singly or together. Withdrawal of the Examiner's rejection and allowance of Claims 12 and 18 are respectfully requested.

It is respectfully submitted that, with regard to the Graham v. John Deere requirements, the Examiner's analysis of the scope and content of the prior art and ascertaining the differences between the prior art and the claims at issue has extended the teachings of the prior art and has argued that they teach aspects of the presently claimed invention that are clearly not disclosed or suggested in the cited art. In particular, Applicants' position is that none of the prior art patents disclose or suggest translating codes that have a predetermined external Galois-field representation into an internal quadratic subfield Galois-field representation, making computations using the internal quadratic subfield Galois-field representation of the code and circuits that are configured to process the quadratic subfield representation, and then translating back to the external Galois-field representation. The internal quadratic subfield Galois-field representation used in the present invention is not the same as a conventional Galois-field representation disclosed in the prior art patents.

The Examiner argued that the modules disclosed in the Okita patent "inherently" perform the functions of the recited elements of the presently claimed invention. It is respectfully submitted that the recited aspects of the present invention are not inherent to the modules disclosed in the Okita patent. There is no support for this contention contained in the Okita patent. This is mere conjecture on the part of the Examiner.

The Examiner also argued that a transformation from one Galois-field representation into another is the same as and precludes transformation into a quadratic subfield representation, even though the use of a quadratic subfield Galois-field representation is not discussed in any of the cited patents. The Examiner's statement that restricting the use of the circuitry taught in the Okita patent to a subset of the Galois fields for which it was designed does not require an inventive step". It is respectfully submitted that there is no express teaching contained in the Okita patent that it is designed to process an internal quadratic subfield Galois-field

representation of the code. Furthermore, it is respectfully submitted that the internal quadratic subfield Galois-field representation of the code is not a subset of Galois fields for which the Okita system was designed to process. This is mere conjecture on the part of the Examiner.

The prior art made of record and not relied upon is considered pertinent to Applicants' disclosure to the extent indicated by the Examiner.

In view of the above, it is respectfully submitted that all pending Claims are allowable over the art of record and that this application is in condition for allowance. Reconsideration of this application and allowance thereof are earnestly solicited. It is again respectfully submitted that this response does not require further searching by the Examiner, and places this application in condition for allowance, or in any event, places it is better condition for consideration on appeal.

Respectfully submitted,

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